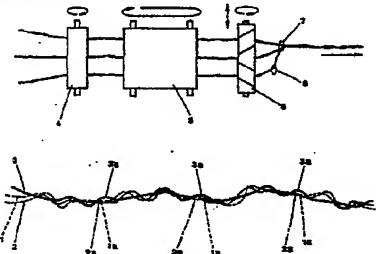




Intellectual Property Office of New Zealand  
IP Summary Report

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<b>(51) Classification:</b> D02G1/00, D02G3/26	<b>Status:</b> 70 Accepted  <b>Client Ref:</b> 24202 GWW/eaw	<b>Version number:</b> 7 <b>IP type:</b> Patent Non-Convention Complete <b>336048</b>
<b>(22) NZ Filing date:</b> 09 June 2000 <b>(71) Applicant:</b> DAVID ARTHUR LEE, 177 Macos Road, Christchurch, New Zealand <b>(72) Inventor:</b> Lee, David Arthur <b>Contact:</b> A J PARK, 6th Floor, Huddart Parker Building, 1 Post Office Square, Wellington, New Zealand <b>Primary Examiner:</b> MIKE GAMBITIS <b>Journal:</b> 1459		<b>Date actions completed:</b> <b>Application Accepted:</b> 08 January 2001 <b>Next renewal date:</b> 09 June 2004
<b>Office title:</b> Winding a smooth finish wool yarn <b>(54) Applicant title:</b> Method for producing a yarn <b>(57) Abstract:</b>  Patent 336048  Three or more slivers of wool or predominantly wool 1, 2, 3 are passed through a single reciprocating twisting stage 6 to be simultaneously twisted into strands each having areas of twist separated by areas of no twist. The strands are then brought together to form a yarn via eyelet 7, one of the strands being diverted via eyelet 8 so that the areas of twist 3a of the strand 3 taking the longer path overlays the areas of non-twist 1a, 2a in the other strands of the finished yarn.  <b>Drawing:</b>  <p>The drawing consists of two parts. The top part is a schematic of a twisting machine with three bobbins (1, 2, 3) mounted on a central shaft, each with a reciprocating twisting stage (6). The bottom part is a diagram of the resulting yarn, showing three strands (1, 2, 3) twisted together, with labels 1a, 2a, 3a indicating areas of twist and non-twist.</p>		

**\*\* End of report \*\***

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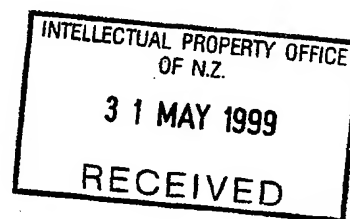
25 PATENTS ACT 1953

PROVISIONAL SPECIFICATION

METHOD FOR PRODUCING A YARN

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We, LANDSDOWN RUN CORPORATION LIMITED, a New Zealand company, of 177  
Maces Road, Christchurch, New Zealand, do hereby declare this invention to be  
described in the following statement:



**FIELD**

The invention comprises a wool yarn or a yarn formed predominantly of wool, and a method of producing the yarn.

5

**BACKGROUND**

In producing a wool yarn or a yarn which is formed predominantly of wool, a number of wool slivers may, typically after drafting, be passed through a twisting stage which comprises one or more reciprocating rollers which move from side to side as the wool slivers pass between the rollers thereby imparting a twist to the strands. After exiting the twisting rollers the strands are brought together with a further twist, to form the yarn.

15 **SUMMARY OF INVENTION**

The patent invention provides an improved method for producing a yarn and an improved yarn.

20 In broad terms in one aspect the invention comprises a method for producing a yarn of wool or predominantly of wool comprising bringing together a number of twisted strands such that areas of twist in one or more of the strands overlay areas of non-twist in one or more other strands in the finished yarn.

25 More particularly the invention comprises a method for producing a yarn of wool or predominantly of wool, comprising passing two or more slivers of wool or predominantly of wool through a reciprocating twisting stage to produce two or more twisted strands and passing one or more of the twisted strands over a longer path before bringing all of the strands together so that areas of twist in the one or  
30 more strands which pass over a longer path overlay areas of non-twist in the other strands in the finished yarn.

Preferably three or more slivers of wool or predominantly of wool are passed through the reciprocating twisting stage and one of the strands then passes over a longer  
35 path before being brought together with the other two strands so that the areas of

twist in the one strand overlay areas of non-twist in the other two strands in the finished yarn.

5 In broad terms in another aspect the invention comprises a yarn comprising a number of twisted strands in which areas of non-twist in one or more strands are overlaid by areas of twist in one or more other strands. In a preferred form the yarn comprises three twisted strands in which the areas of twist in one of the strands overlay the areas of non-twist in the other two strands in the finished yarn.

10 The method of the invention produces a yarn from a reciprocating twisting stage in which there are substantially no areas of non-twist or "flat spots" in the finished yarn as can be the case with yarn formed through a reciprocating twisting stage, because the areas of non-twist in one or more strands of the yarn are overlaid by areas of twist in one or more other strands of the yarn. Rather than all of the yarn  
15 strands passing through the twisting stage together and then being brought together, in the invention one or more of the strands is staggered or delayed relative to one or more of the other strands so that in the finished yarn the areas of non-twist in one or more strands of the yarn are overlaid by areas of twist in one or more other strands. The yarn has improved quality.

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#### **BRIEF DESCRIPTION OF THE DRAWINGS**

The method and yarn of the invention are further described with reference to the accompanying drawings by way of example and without intending to be limiting,  
25 wherein:

Figure 1 is a view of a length of the yarn produced by the method of the invention,

30 Figure 2 schematically shows the stages in producing the yarn of the invention,

Figure 3 is a close up view of one preferred form of apparatus for producing the yarn of the invention showing the drawing unit and twisting rollers thereof, and

35 Figure 4 shows the strands exiting the twisting rollers being brought together by eyelets, in the preferred form apparatus of Figure 3.

## DETAILED DESCRIPTION OF PREFERRED FORM

Referring to Figure 1 the yarn illustrated comprises three twisted strands which are loosely twisted together to form the finished yarn. Strand 3 is "staggered" relative to strands 1 and 2, so that the areas of twist 3a in strand 3 align with the areas of non-twist 1a/2a in strands 1 and 2 as shown. Figure 1 exaggerates this for clarity. In the finished yarn the areas of non-twist in strands 1 and 2 are overlaid by areas of twist in strand 3 so that the finished yarn does not comprise "flat spots" or significant areas of non-twist in the finished yarn.

Figure 2 schematically shows the steps in production of the yarn in one preferred form. The preferred form apparatus comprises a conventional drafting unit 5 comprising opposed moving rubber belts between which the fibres pass. Three wool slivers (unspun) drawn from drums or other bulk supply (not shown) are fed between rollers 4 and through the drafting unit 5 and are drawn out - typically the thickness of the wool fibre assembly is reduced to one half to one 25<sup>th</sup> of the initial thickness. The amount of thickness reduction may be adjusted by altering the speed of the drafting units.

The apparatus comprises a reciprocating twist roller 6 which as well as rotating it reciprocates back and forth across the direction of movement of the strands as the apparatus operates. The twist roller 6 thus imparts twist in one direction as the roller moves one way followed by a twist in another direction as the roller moves the other way in operation. In addition there can tend to be an area of non-twist in the strands or each of them at the point at which the roller changes direction.

Two of the strands are led through eyelet 7 such that these two strands follow a path of similar distance to each other, while the third strand is led through eyelet 8 which is so positioned that the third strand passes over a path of predetermined longer distance, before entering the eyelet 7. As the three strands exit the eyelet 7 they tend to self twist together or alternatively a further twisting mechanism may optionally be provided to assist in twisting the three strands together, to form the finished yarn.

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The length of the longer path over which the third strand passes, through eyelet 8, is such that the areas of non-twist in the third strand do not align with the areas of non-twist in the first two strands. The areas of twist in the third strand overlay the areas of non-twist in the first two strands in the finished yarn.

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Figures 3 and 4 show one preferred form apparatus for forming the yarn of the invention in more detail. In these figures the same reference numerals as in Figure 2 indicate the same components, ie the roller 4, drafting unit 5, twist roller 6 and exit eyelets 7 and 8.

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The foregoing describes the production of yarn from three strands but alternatively four strands may be brought together in an arrangement whereby one or more strands are staggered relative to one or more other strands such that the areas of twist in one or more strands overlay areas of non-twist or one or more other stands.

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The foregoing description and drawings illustrate one possible apparatus for forming the yarn of the invention by the method of the invention and other arrangements may be possible which achieve a multi-stranded yarn formed with a reciprocating twist stage in which some strands of the yarn are staggered relative to other strands when the strands are brought together to form the yarn, such that areas of twist in one or more strands overlay areas of non-twist in one or more other strands.


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The foregoing describes the invention including a preferred form thereof. Alterations and modifications as will be obvious to those skilled in the art are intended to be incorporated within the scope hereof.

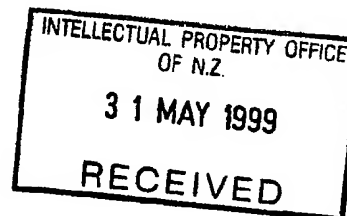
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RUSSELL McVEAGH WEST-WALKER

per:



ATTORNEYS FOR THE APPLICANT



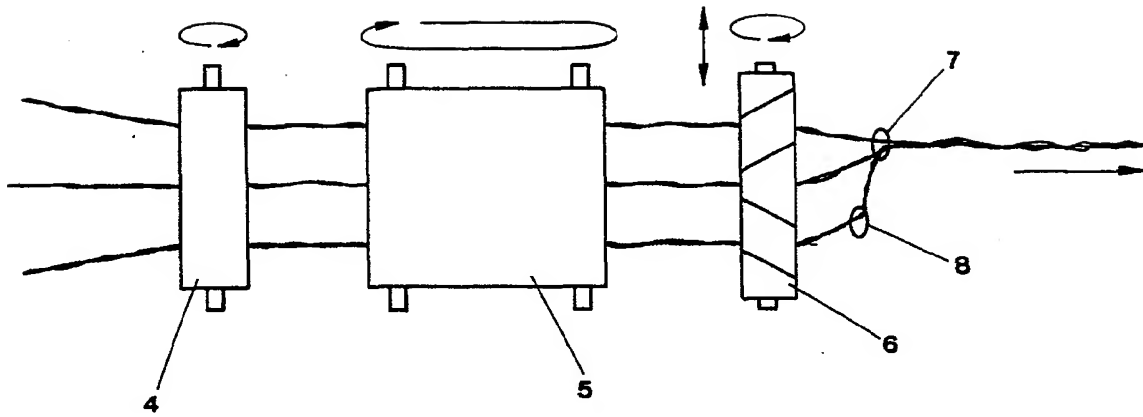


Figure 2

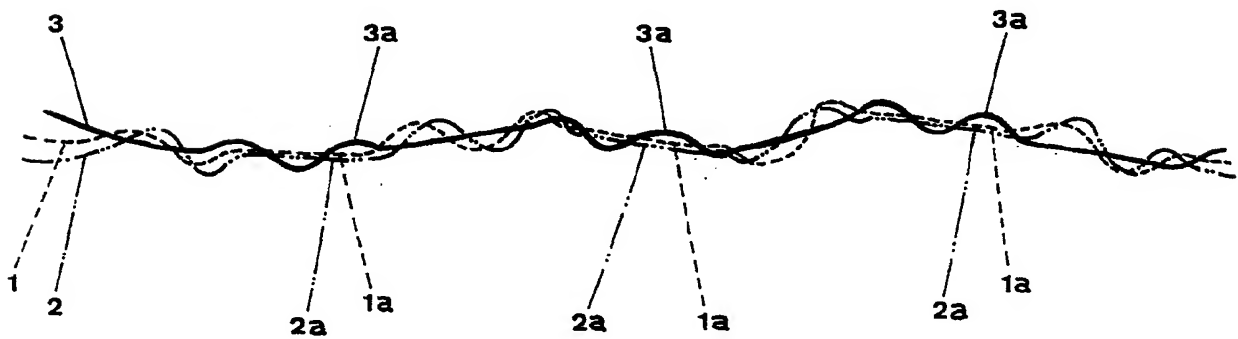
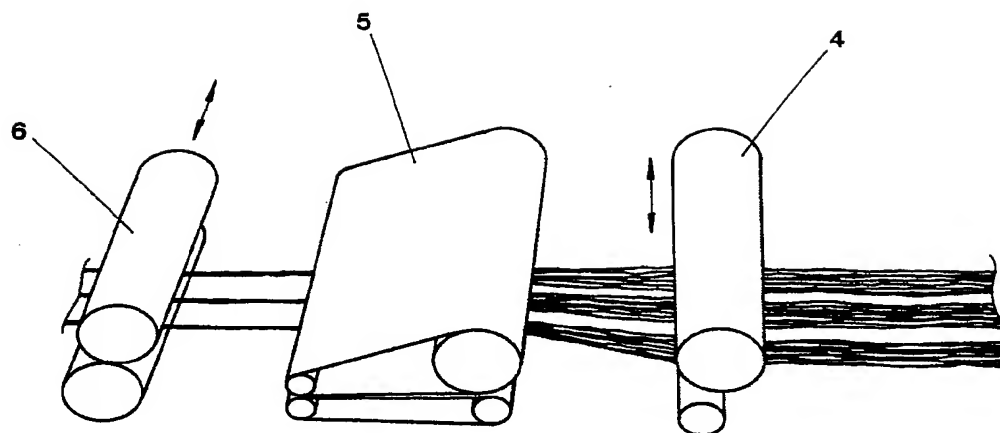
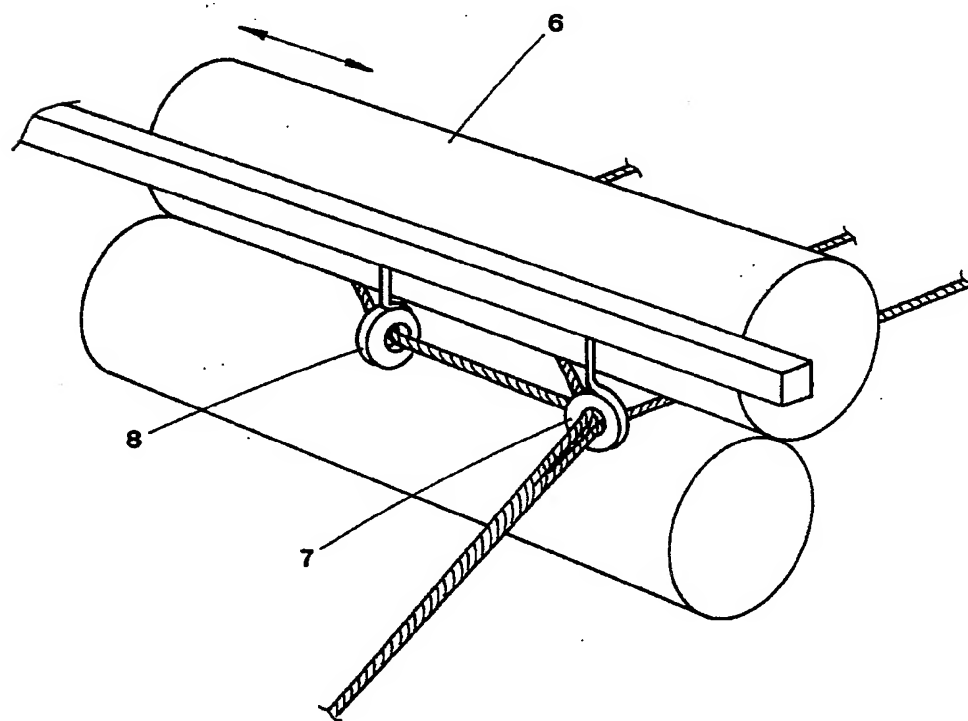


Figure 1

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**Figure 3**



**Figure 4**

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